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ABSTRACT

The purposes of this study were to examine the relationship between academic achievement and demographic and school background variables for school districts and school buildings and to develop from these relationships a basis for comparing achievement at similar schools. The sample consisted of Iowa public school districts that participated in the fall 1983 Iowa Basic Skills Testing Program at either the elementary or the junior high level, a total of 156 school districts. This included 356 elementary school buildings and 169 junior high buildings. Data were collected from the Iowa Department of Public Instruction, the National Center for Educational Statistics (1980 Census data), Iowa Testing Programs, and questionnaires completed by elementary and junior high school principals. Composite scores for fourth and fifth grades were combined to form an elementary school achievement score, and composite scores for seventh and eighth grades were combined for a junior high school achievement score. Regression analyses were performed separately for elementary and junior high levels to identify variables which significantly improved the prediction of achievement. Demographic variables were entered into the regression analyses first, followed by the school background variables. Results suggest that decisions made by schools do affect the achievement levels at the school. (Author/PN)

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THE RELATIONSHIP OF SCHOOL BACKGROUND FACTORS TO SCHOOL BUILDING AND SCHOOL DISTRICT ACHIEVEMENT

by

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ABSTRACT

School administrators frequently want to compare academic achievement at their schools to achievements at similar schools. The purposes of this study were to examine the relationship between academic achievement and demographic and school background variables for school districts and school buildings and to develop from these relationships a basis for comparing achievement at similar schools.

The sample consisted of Iowa public school districts that participated in the fall 1983 Iowa Basic Skills Testing Program at either the elementary or the junior high level, a total of 156 school districts. This included 356 elementary school buildings and 169 junior high buildings. Data were collected from the Iowa Department of Public Instruction, the National Center for Educational Statistics (1980 Census data), Iowa Testing Programs, and questionnaires completed by elementary and junior high school principals. Composite scores for fourth and fifth grades were combined to form an elementary school achievement score, and composite scores for seventh and eighth grades were combined for a junior high school achievement score. Regression analyses were performed separately for elementary and junior high levels to identify variables which significantly improved the prediction of achievement. Demographic variables were entered into the regression analyses first, followed by the school background variables.

The district and building analyses identified parents' occupation level and percent of students receiving nutrition aid as variables which were associated with achievement and which were useful for predicting school achievement at both elementary and junior high levels. Other socioeconomic variables, particularly median family income, percent of single parent families, and amount of student transfers, were also indicated as predictors of achievement. Even with these variables included, some school variables significantly improved prediction of achievement. Total building enrollment seemed to be a variable useful for defining similar schools. The length of the school day and the amount of time devoted to teaching basic subject areas were significant in the elementary school analyses. Principal's experience and time devoted to student discipline were significant in the junior high analyses. Finally, how school districts allocated operating funds was associated with achievement and was useful for predicting school district achievement levels.

INTRODUCTION

The effectiveness of public school education in the United States has been receiving increasingly widespread attention. There are many reasons for the increased concern. For example, government and business officials suggest that outcomes of American education are inferior to the educational outcomes in some other industrialized countries. They fear this may compromise the future economic and scientific competitiveness of the United States (Howe, 1983 and Hunt, 1984). Reports of declining test scores and rising costs have contributed to taxpayer demands for accountability from schools. Parents want assurance that their children are receiving a "good" education. In addition, teachers and school administrators evaluate instructional effectiveness of educational programs to assist development of new programs and revision of existing programs. School boards and educational agencies also consider the success of the educational programs in allocating limited resources.

Before school effectiveness can be evaluated, the meaning of school effectiveness must be determined. Madaus, Airasian, and Kellaghan (1980) emphasize that school effectiveness should be considered in terms of the goals and objectives of the school. However, there is not total agreement on what the goals and objectives of schools should be. Emphasis on basics is proposed by some, while others want time for art, music, foreign languages, citizenship, and, in parochial schools, religious education (Roos & Horstmeyer, 1983b; Wolterstorff, 1983). Goodlad (1983a, 1983b) discusses the emergence of goals for schools in

the United States. He states that American society has a long-standing commitment to a wide range of goals for education including goals for social and personal development as well as intellectual and academic growth. Goodlad (1983a) states that for many, particularly those without children in school, academic achievement is the only relevant educational outcome. Parents may share this focus for schooling in general, but for their own children they expect much more. Clearly, academic achievement is only one of the goals of American public school education. Schools which succeed in promoting academic excellence may or may not be effective schools in achieving the other goals. Nevertheless, Tyler (1983) notes that data from numerous sources show large differences from school to school in academic achievement. Without denying the importance of the other goals of education, this paper will be concerned with differences in academic achievement between schools.

Scores on standardized achievement tests are often defined as measures of instructional effectiveness. These tests allow comparisons of a school's achievement with the achievements of other schools in the norming sample. While these comparisons may be useful, they do not provide for consideration of many other factors which are associated with academic acheivement. Cronbach (1970) and Mehrens and Lehmann (1975) assert that the aptitude range of the students in the schools should be considered when making comparisons of effectiveness between schools. Furthermore, Cronbach (1970) cautions that, in addition to the range of students' abilities, many other factors need to be considered when comparing schools' achievement.

> The only fair basis for comparing schools is to judge each school against schools with similar organization, similar curricula, and similar problems. (Cronbach, 1970, p. 107).

Currently, publishers of standardized tests provide varying amounts of information which might help school administrators compare the achievement of their schools to the achievement at similar schools. However, even with the publishers providing the most normative information, school administrators still have relatively little choice in defining similar schools for comparison.

PURPOSES

The purposes of this study are:

1. To combine information available from the Iowa Department of Public Instruction, the Census Bureau, and school principals in Iowa public elementary and junior high schools to describe school district and building background factors and school policies which may affect the academic achievement at the schools;
2. To examine in a group of Iowa public elementary and junior high schools the relationships between academic achievement at the school building and district levels as measured by the Iowa Tests of Basic Skills (ITBS) (Hieronymus, Lindquist, & Hoover, 1982) and school district and school building background factors and school policies;
3. To identify those relationships which might be used by school administrators to compare the achievement at their schools to the achievement at similar schools as defined by the school administrator.

REVIEW OF LITERATURE

Research on the factors that are and are not associated with school achievement has been available for some time. Two books on inequality in education, the Coleman (1966) report and Jencks' (1972) book, particularly have received public attention. These authors suggest that differences between schools account for only a small part of the differences in educational achievement between individual students. Recently, there has been a flurry of research on the characteristics of unusually effective schools. Most of these studies define effectiveness in terms of some measure of academic achievement. The National Commission on Excellence in Education report (1983) has generated an increased public concern with academic achievement in schools (Roos & Horstmeyer, 1983a, 1983b; Williams, 1983). However, the level of academic achievement in a school is affected by many variables, some of which are not under the school's control.

Demographic Variables

Demographic variables, which are beyond the control of school administrators, have been suggested as the major correlates of school achievement. In particular, the socioeconomic and family background of the student body seem to be important. White (1982) in a review of research on socioeconomic status (SES) and academic achievement reports that when data are aggregated, such as by school district, the median correlation between SES measures and academic achievement is 0.73. White cautions that there are many definitions for SES and that the

correlation between achievement and SES varies with the type of SES measure used. Parents' education and occupation are reported by many to be associated with achievement (Belz & Geary, 1984; California State Department of Education, 1977a, 1977b; Feldt & Forsyth, 1966; Hilpert, 1970; Schneider, Glasheen, & Hadley, 1979; Skaggs, 1969). Racial-ethnic mix and bilingualism are also reported as a factor in school achievement by Boocock (1966) and the California State Department of Education (1977a, 1977b). However, Mayeske and Beaton (1975) in a continuation of the reanalysis of the Equality of Educational Opportunity data report that when socioeconomic and family background factors are controlled, ethnic group differences tend to disappear. In addition, a 1973 Mayeske et al. study also reports that any differences between English-speaking and non-English-speaking families seem to be explained mainly by socioeconomic factors. The role of family structure (both parents present, single parent, foster home) is generally less important than SES (Marjoribanks, 1982; Mayeske et al., 1973). However, Belz and Geary (1984) suggest that a father's absence from the home may affect both verbal and quantitative cognitive development.

Not all researchers agree on the importance of SES to educational achievement. Rutter (1980) in a study of schools of London, England, argues that it is student ability which is crucial for achievement rather than social and ethnic mix. Anderson (1982) reviews literature on school climate and concludes that direct climate measures explain the variance in school achievement better than SES and racial mix do. Schneider, Glasheen, and Hadley (1979) caution that the effect of SES on

achievement varies widely between school buildings and may have very little effect in a particular building.

Entry-level achievement is singled out as the most important predictor of later achievement by Hilpert (1970) and the California Department of Education (1977a, 1977b). Mayeske et al. (1973) propose that the achievement and motivational mix of entering students creates an accepted rate of performance which is perpetuated throughout the school years. This established rate of educational performance affects each student independent of family background. Mayeske and associates suggest that the real importance of family background is its influence on the achievement and motivational attributes of entering students. Furthermore, they suggest that the achievement and motivation of the students with whom a student attends school play a much larger role in that student's achievement than their social composition. Summers and Wolfe (1975) and Rutter et al. (1979) find that the proportion of high achieving students in a school is associated with the overall level of achievement at the school and is particularly influential on the achievement of lower ability students.

The proportion of students transferring in and out of a school during the year is also associated with achievement (Guthrie et al., 1971; Feldt & Forsyth, 1966). Summers and Wolfe (1975) suggest that frequent family moves seem to have little effect on the achievement of elementary or senior high school students but do have an adverse effect on junior high student achievement.

School Background and Policy Variables

School background and policy variables have also been proposed as variables related to academic achievement. Some of these variables, such as size of the school district, are not easily changed by school administrators. Other school background and policy variables, such as amount of instructional time, homework and attendance policies, or budget allocations, can be altered by administrative decisions. The factors over which schools have some control are often divided into those factors which are objective and reasonably easy to measure and those which are more subjective factors describing school culture and process (Anderson, 1982; California State Department of Education, 1977a, 1977b; Purkey & Smith, 1983). In general, those factors which are measurable and relatively easy for schools to change have not proved to be very informative with regard to achievement. However, some objective, measurable variables such as amount of instructional time have been associated with achievement (California State Department of Education, 1982).

Cronbach (1970) notes that there are differences in achievement associated with size of school. However, the research in this area is not conclusive. In a review of literature on size of schools and school districts, Stemnoch (1974) suggests that while other factors are much more important to achievement than school size, larger schools are less efficient with regard to achievement than smaller schools. Summers and Wolfe (1975) conclude that smaller schools are associated with increased learning at the elementary and senior high school levels but school size

has no effect at the junior high school level. Skaggs (1969) reports a curvilinear relationship between system enrollment and achievement. Rutter (1980) finds no consistent difference between school size and pupil success. Mayeske et al. (1972) note that achievement in small schools, particularly those with high SES levels, is less predictable than achievement in other schools. Research by the California Assessment Program (California State Department of Education, 1977a, 1977b) finds that size of community and size of district are not significant factors in achievement.

Because resource allocation and use is an area in which school administrators can make changes, the relationships between educational achievement and the allocation and use of various resources have frequently been studied. Expenditure per pupil and its relationship to educational achievement have been examined with differing conclusions. Coleman et al. (1966) and Hilpert (1970) conclude that additional expenditure contributes little toward increased achievement. From a review of literature, Hanushek (1981) points out that while the average expenditure nationwide both for instruction and for overall school expense has increased from 1960 to 1978, average achievement has declined. However, based on the National Assessment of Educational Progress data, performance improved between 1970 and 1982 in curriculum areas and among those groups of students targeted for federal funding (Lapointe, 1984). Even with the effect of SES removed, per pupil expenditure is a factor in achievement according to Dyer (1968). Pitts (1978) finds that the proportion of a school's budget spent for

instruction is significantly related to achievement, but the proportion spent on administration is not related to achievement. Cohen (1982) notes that the amount of resources in a school is less important than how well the school uses and organizes available resources. Nevertheless, adequate resources are a precondition for achievement. Finally, as Mackenzie (1983) states, the availability of resources does not guarantee their effective use.

Another area reflecting resource use is class size and pupil/teacher ratio. The research findings on this subject are also conflicting. The effects of class size and pupil/teacher ratio seem to be small if present (Coleman et al., 1966; Rutter, 1980; Skaggs, 1969). Skaggs comments that as long as pupil/teacher ratio is below 25, there is little effect on achievement. As the ratio rises above 25, achievement is decreased. Summers and Wolfe (1975) propose that smaller classes (less than 28 pupils) are especially important for students who are below grade level. These authors state that class sizes above 33 students have a negative effect on achievement for students of all ability levels. Using a meta-analysis of research on the effects of class size, Hedges and Stock (1983) and Glass and Smith (1980) conclude that smaller classes lead to higher expected achievement and that class size accounts for a substantial amount of the variance in achievement.

Teachers, principals, and superintendents themselves might be considered part of school resources. The stability of the teaching and administrative staff has been suggested as a factor in achievement (Anderson, 1982; Purkey & Smith, 1983; Skaggs, 1969). Teacher or

principal experience is named by some researchers (Austin, 1981; California State Department of Education, 1977a, 1977b; Dyer, 1968; Lyle, 1967; Summers & Wolfe, 1975; Mackenzie, 1983), but others (Coleman et al., 1966; Purkey & Smith, 1983) believe that teacher experience has little effect on achievement. Teacher and principal education has also been proposed as affecting achievement (Anderson, 1982; Austin, 1981; California State Department of Education, 1977a, 1977b; Coleman et al., 1966; Mayeske et al., 1972).

The amount of instructional time and the emphasis of the curriculum are policy variables which have been studied with respect to their effect on achievement. Mackenzie (1983) and Cohen (1982) suggest that one of the explanations for differences in effectiveness is the amount of emphasis on basic skills. Leithwood and Montgomery (1982) state that effective principals emphasize "the basics" in curriculum planning, particularly when problems with achievement are present. Research by the California Assessment Program (California State Department of Education, 1982) suggests that schools with a larger proportion of low SES or low-achieving students allocate a larger proportion of instructional time to reading. They find a negative relationship between instruction time and achievement in reading. However, they interpret this as the effect of achievement on instructional time rather than vice versa. The proportion of the school day actually devoted to instruction has been identified as a potent factor in achievement (Bloom, 1974; Wiley & Harnischfeger, 1974; Austin, 1981; California Department of Education, 1982; Leithwood & Montgomery 1982; Murphy et

al., 1982; Purkey & Smith, 1983). Goodlad (1984) reports that there seem to be large differences between schools in the amount of time devoted to instruction. This variation is due to differences in the length of the school day as well as differences in the allocation and use of in-school time. Karweit (1984) cautions that the relationship between instructional time and achievement must be interpreted carefully. Karweit notes that effective use of time may be a result of principal's leadership, staff competence, or student orderliness. As a result, lengthening the school day alone may not improve achievement.

Several other school policies have been proposed as affecting academic achievement. A policy promoting the assignment of meaningful homework is associated with achievement (Coleman, 1982; Coleman, Hoffer, & Kilgore, 1982; Keith, 1982; Mackenzie, 1983; Murphy et al., 1982; Rutter, 1980). Rigorous attendance policies which are enforced are also associated with higher achievement (Coleman, 1982; Coleman et al., 1982; Schneider et al., 1979). Schneider and associates note that attendance especially is associated with achievement measured by teacher-assigned grades but is also associated with scores on standardized achievement tests. Monk and Ibrahim (1984) report that both the quantity and the pattern of student absences are related to classroom achievement. Achievement is also enhanced by policies which lead to an orderly, disciplined environment (Cohen, 1982; Coleman et al., 1982; Mackenzie, 1983; Rutter, 1980; Summers & Wolfe, 1975). However, the California State Department of Education (1977a, 1977b) reports no differences between low- and high-achieving schools in district policies on student

conduct, classroom rules, or discipline. Frequent monitoring of student progress and reporting to parents (Cohen, 1982; Murphy et al., 1982; Purkey & Smith, 1983), recognition of academic success (Anderson, 1982; Purkey & Smith, 1983, Rutter, 1980), and staff in-service programs (Austin, 1981; California State Department of Education, 1977a, 1977b; Leithwood & Montgomery, 1982; Purkey & Smith, 1983) have all been associated with more effective schools.

Anderson (1982) includes student and staff morale among the climate factors associated with achievement. Both student and staff attendance rates may reflect the presence or absence of high morale (Rutter, 1979; Bridges & Hallihan, 1978). Wynne (1981) notes that teachers' regular and prompt attendance helps to create a climate of enthusiasm, caring, and professionalism. Shaw (1981) discusses the negative effect of teacher absenteeism on educational progress and relates absenteeism to teachers' level of morale and their perception of principal's leadership style. The role of the principal in creating an effective school environment has been examined by Leithwood and Montgomery (1982). They believe that the effective principal is an instructional leader rather than strictly a school administrator. Effective principals develop procedures so that routine business can be handled quickly. They promote teacher morale by encouraging teachers to share ideas and cooperate in coordinating the curriculum and by being involved in all areas regarding instruction. However, DeBevoise (1984) suggests that different leadership styles and personalities of principals interact with the uniqueness of each school. Consequently, generalizations about

principal's leadership style and personal characteristics are difficult to make. Nevertheless, Tanner (1981) suggests that the principal's leadership style affects both achievement and teacher satisfaction and may be the most critical variable in school effectiveness.

In summary, academic achievement is affected by a multitude of factors, many of which are outside schools' control. Nevertheless, identification of the most potent factors can aid in realistic evaluations of schools' effectiveness in promoting academic achievement.

METHOD

Sample

The sample for school buildings consisted of all Iowa public elementary and junior high school buildings that participated in the 1983 fall Iowa Basic Skills Testing Program. The number of buildings testing in each grade is shown in Table 1. The school district sample included the Iowa public school districts which participated at either the elementary or the junior high level, a total of 156 school districts. Large districts having more than five buildings comprised about 13 percent of the school districts in the sample. Buildings which tested only for Chapter I purposes in the fall 1983 were dropped. School buildings with a total Grade 3 through Grade 8 enrollment of less than 15 students were dropped from the analyses by building but were included in district analyses. Because the data for one school district were not identified by building, the data for that district were not included in the building analyses.

Table 1

Buildings Participating in 1983 Fall
ITBS Testing, By Grade

Grade	Number of Buildings
4	339
5	334
7	164
8	163
4 / 5	356
7 / 8	169

Criterion Measures

Criterion measures were the average composite scores on the ITBS for the combined elementary school fourth and fifth grades and for the combined junior high school seventh and eighth grades. Iowa grade equivalent scores were used. The scores were combined because, particularly in schools with fewer than 20 students per grade, achievement scores based on a two grade average were more stable. The grade equivalent score for the statewide 50th percentile was subtracted from the composite score for each grade. The resulting scores for the fourth and fifth grades were then averaged to form an elementary achievement score and the scores for the seventh and eighth grades were averaged to form a junior high achievement score.

Background and School Variables

As the review of literature indicates, many variables have been related to academic achievement. For practical reasons, not all of the variables which have been identified as potentially affecting achievement could be included. Some of the interesting variables could not be quantified easily or measured by questionnaire. Quantifiable variables were emphasized in this study so that regression and correlation techniques could be used in the analyses. Because information was gathered about a large number of school buildings and districts, the data were collected from existing data banks or from questionnaires rather than through observation or interview. Consequently, such variables as student values and attitudes, principal's leadership style, and teachers' instructional and classroom management methods were not included. Entry-level achievement data were not available for most schools.

The SES level of a school district was assessed from adult occupation and education levels, median family income, per capita income, and percentage of children in the school district receiving free or reduced-price lunches. Percentage of children receiving free or reduced-priced lunches and principal's estimates of parents' occupation level were collected to assess the average SES level in the school buildings. Information on minority enrollment, private school enrollment, language spoken at home, and single-parent families was also collected at the district level.

Education level, experience, and salary of superintendents, teachers, and principals were collected for each building and district. Pupil/teacher ratio, building and district size, as well as urban/rural location were also collected. Number of days in the school year and average daily attendance were collected at the district level. Inadvertently, average daily attendance for school buildings was not collected. Principals estimated the percent of time spent in various subject areas in their buildings in order that assessment could be made of the amount of instructional time spent on areas covered by the ITBS. They also estimated the average class size in their building. Principals were asked to estimate number of days of teacher absence, and teacher absence rate was computed as an indication of teacher morale and disruption of instruction in the buildings. Amount of homework, extent of student behavior problems, and distribution of principals' time were collected from principals as indicators of school policies and principal behavior. Expenditure data for the school districts included the percent of the operating fund budget spent on general instruction, transportation, special education, and extra-curricular activities, as as well as total operating fund expenditure. The amount of the total operating fund budget per pupil was computed. In addition, the percents of the operating fund budget spent on building administration and on teachers salaries (not including amounts for coaching or other extra assignments) were computed. The descriptions of these variables are summarized in Table 2 for school districts and Table 10 for school buildings.

Data on the background and school variables were gathered from three sources. Data from the 1980 census tabulated by school district were obtained from the National Center for Educational Statistics (Bureau of the Census, 1984a, 1984b). The variables obtained from the census described the population in each school district. Data about the school buildings and districts were obtained from the Iowa Department of Public Instruction (1982a, 1982b, 1983a, 1983b). For buildings this data included information about the education, age, contracts, and salaries of school personnel, enrollment, and pupil-teacher ratios by grade, and child nutrition data. Department of Public Instruction data on minority enrollment in school buildings were not included because of questionable accuracy. For districts the data included number of days in the school year, expenditure broken down by budget area, and total expenditure in addition to the variables listed for buildings above. Data for the 1982-1983 school year were used. Each building principal was sent a questionnaire requesting data not available from the census or the Department of Public Instruction. The questionnaire, cover letter, and follow-up letter are shown in Appendix A. Approximately 71 percent of the questionnaires were returned.

The data were examined first at the district level and then at the building level. Prior to analysis, the data were examined extensively to remove coding and collection errors. The census data for seven school districts were not included because the numbers of school-aged children in the census data were so different from the enrollment data provided by the Department of Public Instruction that the census data

seemed questionable. Minority data in the census were discarded when there were no white children counted in the district. The questionnaires were edited to force percentages to add to 100%, to change weekly instruction times to daily times, and to omit obvious errors.

District Analyses

The Statistical Analysis System (SAS) (SAS Institute, 1982a, 1982b) was used to perform the statistical analyses. Means, standard deviations, ranges, and Pearson product-moment correlations were computed for each variable using the CORR procedure in SAS. All variables were plotted against the criterion variables using the SAS procedure PLOT. No non-linear relationships were detected.

After these initial descriptive procedures were completed, a few variables were dropped from further analyses. Because the range of values for non-English speaking students was so narrow, that variable was dropped from further consideration. The amount of total operating budget was also dropped as a variable because the relationship ($r = 0.998$) between total operating budget and total enrollment was nearly one-to-one. Class size was dropped from the building data because some principals appeared to have reported the average number of students per grade rather than the average number of students per classroom.

The composites, Education Level and Occupation Level, were used to reduce the number of variables. Education level was computed by weighting the categories reported by the census from 0 to 4 and summing

the weighted percentages. The categories of education reported by the census were the percents of persons 25 years old and older in the school district who did not graduate from high school, who graduated from high school, and who attended college from 1 to 3 years, 4 years, and 5 or more years. The census reports the percents of persons who identify their occupation in the following areas: executive, managerial, and administrative (4); professional (4); technical and related support areas (3); sales (2); administrative support including clerical (2); protective service (2); private household service and other service (1); farming, forestry, and fishing (2); craft, precision production, and repair (1); machine operators, assemblers, and inspectors (1); transportation and material moving (1); and handlers, equipment cleaners, helpers, and laborers (0). The numbers in parentheses represent the weights that were used to compute Occupation Level.

A series of regression analyses were run separately for elementary and junior high composite scores. The SAS procedure STEPWISE with the MAXR model selection method was used for all regression analyses. The MAXR selection method is similar to the traditional stepwise method of regression, but R^2 is the basis for selection in the MAXR method rather than the largest F.

First the variables were divided into those which described demographic features of the school districts and those which described the school itself. A regression was computed using only the demographic variables. The equations generated by the analysis of the demographic variables were examined beginning with the equation having one

independent variable, followed by the two-variable equation, etc. The equation was identified which had the largest number of variables all contributing significantly to the prediction of achievement in the presence of the others. A significance level of 0.05 was used. These demographic variables were forced into the regression, and then the school variables were allowed to enter. Again, the resulting equations were examined, and the equation was identified with the largest number of school variables all contributing significantly to prediction of achievement in the presence of both school and demographic variables.

Building Analyses

Means, standard deviations, ranges, and Pearson product-moment correlations were computed using the CORR procedure in SAS. The principals' estimates of parent occupation were combined into the variable, Occupation Level, by weighting the categories (0 - Unskilled; 1 - Semi-Skilled; 2 - Skilled, Technical; and 3 - Professional, Executive) and summing the weighted percentages. The estimates of pupil behavior were coded as 1 - never a problem, 2 - seldom a problem, 3 - often a problem, and 4 - a very serious problem. The times spent teaching the instructional areas of Language Arts, Reading, and Mathematics were grouped to form the variable, Time Spent on Instruction in the Basics. These three areas were the instructional areas which corresponded most clearly to the areas tested by the ITBS. Hours of homework, instructional time in each area, enrollment, and pupil-teacher ratio were averaged for fourth and fifth grades to form elementary

school values and for seventh and eighth grades to form junior high values. Percentages were formed for teacher absence and for students transferring using DPI data on number of teachers and students. The percent of students receiving nutrition aid was based on DPI data except when there were missing values in the DPI data. Then the principal's estimate was used. The DPI data and principals' estimates of the percent free and reduced-priced lunches correlated highly (0.8) even though they were based on different points in time during the 1982-83 school year.

A series of regression analyses were computed for elementary and junior high achievement separately using the STEPWISE procedure in SAS. The regression procedure described previously was used. First, a regression was computed for demographic variables only. In the second regression analysis, the selected demographic variables were entered first. Then the school variables for which there were fairly complete data were entered. These included data on school personnel, enrollment, and pupil-teacher ratio. In the third regression analysis, the selected variables from the previous analyses were entered followed by the remaining school variables, except principal's time uses. Principal's time uses were entered into a fourth regression analysis with the variables selected in previous steps.

RESULTS AND DISCUSSION

The results of the analyses of school district data will be presented and discussed first, followed by presentation and discussion

of the results of the analyses of building data. Then, implications of the building and district results will be considered together.

Results and Discussion of the District Analyses

The means, standard deviations, and ranges for school districts are shown in Table 2. The school districts in this sample were predominantly rural with few minority students. The adults in these school districts averaged slightly more than a high school education and had an occupation level that averaged between semi-skilled and skilled. The percent of children receiving free or reduced-price lunches varied from 5% to 47% with an average of 22% of the students in a school district receiving nutrition aid. Median family income in these districts ranged from $13,378 to $29,152. There was little variation in the number of school days because the state of Iowa requires public schools to have 180 days in the school year. Student attendance was good with attendance ranging from 90 to 97%. With respect to finances, these school districts spent an average of 40% of their operating budget on instructional salaries. Their allocation for transportation ranged from none to 15% of their operating budget. Costs of special education programs ranged from 3% to 12% of the budgets. On the criterion variable, the variability of junior high school achievement was greater than the variability at the elementary level.

Many of the demographic variables were highly intercorrelated. The absolute values of the correlations between median family income, per capita income, percent of children receiving nutrition aid, education

Table 2

Summary Statistics for School and Demographic and for Achievement and for Achievement

Variables	Abbrev	Source	N	Mean	SD	Range
DEMOGRAPHIC BACKGROUND VARIABLES:						
Total Population	TPOP1F	CEN	149	10,930	23,502	887-202,070
% Rural	PCRUR	CEN	149	70	37.3	0-100
% Urbanized Area	PCUA	CEN	149	9	27.2	0-100
% Minority in School Age Pop.	PCMIN	CEN	137	2	3.2	0-24
% Single-Parent Families	SNGLPAR	CEN	149	11	3.8	4-24
% Non-English Speakers in School Pop.	NONENGL	CEN	149	0	.4	0-2
% Private School Enrollment	PCPVT	CEN	149	6	9.7	0-60
Adult Education Level	EDLEVEL	CEN	149	1.12	0.218	0.78-2.14
Adult Occupation Level	OCCLEVEL	CEN	149	1.90	0.163	1.41-2.55
Median Family Income	MEDINC	CEN	149	$19,115	$3210	$13,378-29,152
Per Capita Income	PERCAPIN	CEN	149	$6869	$927	$4839-10,897
% Pupils Receiving Nutrition Aid	NUTRAID	CEN	156	22	8.0	5-47
SCHOOL BACKGROUND VARIABLES:						
Total Enrollment	TENROLL	DPI	156	1782	3692	139-32,784
No. Days in School Year	DAYSYR	DPI	156	179.5	0.58	178-182
% Attendance	PCATT	DPI	156	96	1.2	90-97
Superintendent: Years of Experience	SEXPTO	DPI	154	23.4	8.17	0-40
Highest Degree	SUPTED	DPI	150	2.8	1.11	2-5
Per Diem Salary	SUPTSAL	DPI	154	$154	$26.90	$101-235

Table 2 (cont.)

Variables	Abbrev	Source	N	Mean	SD	Range
SCHOOL BACKGROUND VARIABLES CONTINUED:						
Principals:						
Years of Experience	PEXPTO	DPI	154	19.0	5.78	2-33
Highest Degree	PRINED	DPI	154	2.1	0.24	1-3.5
Per Diem Salary	PRINSAL	DPI	154	$134	$14.17	$80-167
Teachers:						
Years of Experience	TEXPTO	DPI	156	12.9	2.66	6.6-19.7
Highest Degree	TEACHED	DPI	156	1.2	0.14	0.79-1.58
Per Diem Salary	TEACHSAL	DPI	156	$94	$11.17	$65-120
Finance:						
Per Pupil Budget	TBUDGPC	DPI	156	$2774	$252	$2175-3879
% General Educ.	PCGNED	DPI	156	43	3.6	32-56
% Special Educ.	PCSPED	DPI	156	7	1.9	3-12
% Transportation	PCTRNS	DPI	156	7	2.6	0-15
% Extra-Curricular	PCXCUR	DPI	156	2	0.7	0-5
% Administration	PCADM	DPI	156	9	1.5	6-13
% Teachers' Salaries	PCTSAL	DPI	156	40	3.2	29-48
CRITERION VARIABLES:						
Elementary Composite	ACHELEM	ITP	131	1.24	2.75	-6.96,6.46
Jr. High Composite	ACHJRHI	ITP	146	0.92	3.76	-9.17,10.15

level, occupation level, percent rural population, and percent population in urbanized areas ranged from 0.07 to 0.87. To a lesser extent, the school variables were also intercorrelated. In particular, superintendents' salaries, teachers' salaries, and teachers' level of education were associated with total enrollment. The correlations between the demographic background variables and the correlations between the school background variables are shown in Appendix B.

The correlation between elementary school achievement and junior high achievement within a school district was 0.58 which was lower than the correlation of 0.79 reported by the Iowa Testing Programs (Hieronymus, Lindquist, & Hoover, 1982). The Iowa Testing Programs correlation was based on data from a study of ITBS results for Grade 5 and Grade 8 students in the state of New York. Both the correlation from the New York state data and the correlation in this study were cross-sectional correlations based on the system average for different grades in the same year. The smaller correlation found in this study may have been due to greater homogeneity in Iowa school districts compared to school districts in New York state.

The correlations between elementary and junior high achievement and the demographic and school variables are shown in Table 3. The occupation level of the adults in the school district had the largest positive correlation with achievement in both junior high and elementary schools. Achievement for both junior high and elementary schools was most negatively correlated with the percent of students receiving nutrition aid.

A series of regression analyses were run using the procedures described previously. Note that for these regressions, total population was expressed in tens of thousands; median family income, per capita income, and total district enrollment were expressed in thousands; school personnel salaries and per pupil budget were expressed in hundreds of dollars. First, the demographic background variables were entered into the regression analyses for elementary and junior high

Table 3

Correlations Between Background and School Variables and Achievement

Variables	Elementary Composite Score		Junior High Composite Score	
DEMOGRAPHIC BACKGROUND VARIABLES:				
Total Population:	-.24	(124)**	-.19	(139)*
% Rural	.00	(124)	.07	(139)
% Urbanized Area	-.07	(124)	-.01	(139)
% Minority	-.21	(114)*	-.15	(129)
% Single-Parent Families	-.16	(124)	-.31	(139)***
% Private School Enrollment	-.15	(124)	-.06	(139)
Adult Education Level	.26	(124)**	.30	(139)***
Occupation Level	.33	(124)***	.40	(139)***
Median Family Income	.04	(124)	.14	(139)
Per Capita Income	.14	(124)	.21	(139)*
% Receiving Nutrition Aid	-.35	(131)***	-.39	(146)***
SCHOOL BACKGROUND VARIABLES:				
Total Enrollment	-.23	(131)**	-.20	(146)**
No. Days in School Year	-.11	(131)	-.06	(146)
Percent Attendance	.25	(131)**	.11	(146)
Superintendent:				
Years of Experience	.06	(129)	-.02	(144)
Highest Degree	-.19	(129)	-.04	(144)
Per Diem Salary	-.15	(129)	-.06	(144)
Principals:				
Years of Experience	.10	(129)	.15	(144)
Highest Degree	.01	(129)	-.09	(144)
Per Diem Salary	-.02	(129)	.00	(144)
Teachers:				
Years of Experience	-.04	(131)	.10	(144)
Highest Degree	.00	(131)	-.06	(144)
Per Diem Salary	-.11	(131)	.00	(146)

Table 3 (cont.)

Variables	Elementary Composite Score		Junior High Composite Score	
Finance:				
Per Pupil Budget	-.05	(131)	-.05	(146)
% General Education	.29	(131)***	.19	(146)*
% Special Education	-.24	(131)**	-.29	(146)***
% Transportation	-.18	(131)*	-.12	(146)
% Extra Curricular	.05	(131)	.17	(146)*
% Administration	.10	(131)	.14	(146)
% Teachers' Salaries	.26	(131)**	.19	(146)*

* $p < .05$, ** $p < .01$, *** $p < .001$

achievement separately. At the junior high level, median family income, the percentage of students receiving nutrition aid, the percentage of single parent families, and the occupation level of adults in the school district significantly improved the prediction of achievement. The regression of junior achievement on these four variables (Table 4) resulted in an R^2 of 0.42 and was significant ($p < .0001$). At the elementary level, the percentage of students receiving nutrition aid, median family income, the occupation level of adults in the school district, and the total population of the district significantly improved the prediction of achievement. This regression resulted in an R^2 of 0.30 ($p<.0001$). See Table 5. Three demographic variables, median family income, level of nutrition aid, and adult occupation level, were significant for predicting both junior high and elementary achievement.

Table 4

Regression of Junior High Achievement on Selected School District Demographic Background Variables

$R^2 = 0.423$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	4	788.57	197.14	222.71	0.0001
Error	124	1076.25	8.68		
Total	128	1864.82			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	-9.55				
MEDINC	-0.26	0.125	36.93	4.25	0.0412
NUTRAID	-12.40	4.805	57.78	6.66	0.0110
SNGLPAR	-36.51	8.041	178.93	20.62	0.0001
OCCLEVEL	11.71	1.879	336.81	38.81	0.0001

The school variables were entered into the regression analyses with the selected demographic variables for elementary and junior high achievement. The demographic variables were forced into the regression, and then the school variables were allowed to enter. For junior high, prediction of achievement was significantly improved by the percentage of the operating budget spent on transportation when the demographic variables were already included in the regression. The regression of junior high achievement on the selected demographic and school variables (Table 6) resulted in an R^2 of 0.47 ($p < .0001$). When school variables were entered into the regression of elementary achievement in the

Table 5

Regression of Elementary Achievement on Selected School District Demographic Variables

$R^2 = 0.299$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	4	257.95	64.49	11.60	0.0001
Error	109	605.84	5.55		
Total	113	863.79			

	b Value	Std. Error	Sum of Squares	F	Prob.
INTERCEPT	-5.27				
TPOP1F	-0.26	0.097	40.98	7.37	0.0077
MEDINC	-0.24	0.103	30.64	5.51	0.0207
NUTRAID	-9.95	3.710	39.97	7.19	0.0085
OCCLEVEL	7.21	1.587	114.65	20.63	0.0001

presence of the selected demographic variables, the percentage of the operating budget spent on teachers' salaries significantly improved the prediction of achievement. The resulting R^2 was 0.35 ($p<.0001$). See Table 7.

It seems clear that the income and occupation levels of the adults within a given school district and the percentage of students receiving nutrition aid were related to the achievement level in that school district and could be used to predict an expected achievement level for the district. In terms of comparing achievement between districts, these demographic variables might be useful in determining "similar"

Table 6

Regression of Junior High Achievement on Selected District Demographic and School Variables

$R^2 = 0.474$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	5	889.85	177.97	22.69	0.0001
Error	126	988.46	7.84		
Total	131	1878.31			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	-1.50				
MEDINC	-0.29	0.115	48.87	6.23	0.0139
NUTRAID	-8.07	4.534	24.83	3.16	0.0776
SNGLPAR	-56.58	8.817	323.02	41.18	0.0001
OCCLEVEL	10.10	1.895	223.00	28.43	0.0001
PCTRNS	-46.39	14.101	84.88	10.82	0.0013

schools. In addition, these variables should be considered when schools are evaluated since they may suggest ranges for expected achievement. Fortunately, data on these variables are available from several sources. School personnel have data available on the income and occupational characteristics of their districts from census records. Schools which participate in the federal school lunch program have easy access to data on nutrition aid since school administrators are required to provide monthly reports on school lunch usage. In addition, many schools collect information about the parent's occupation when students register for school each year.

Table 7

Regression of Elementary Achievement on Selected District Demographic and School Variables

$R^2 = 0.355$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	5	322.63	64.53	12.20	0.0001
Error	111	586.86	5.29		
Total	116	909.49			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	-9.94				
MEDINC	-0.28	0.097	43.87	8.30	0.0048
NUTRAID	-11.75	3.555	57.80	10.93	0.0013
OCCLEVEL	6.41	1.692	75.80	14.34	0.0002
TPOP1F	-0.26	0.094	39.87	7.54	0.0070
PCTSAL	18.32	7.327	33.04	6.25	0.0139

Among the school variables, it appeared that the percentages of the operating budget spent on transportation and instructional salaries were important school variables. Schools which had to allocate more of their budget for transportation may not have been able to allocate as large a percentage for instruction. Schools which were able to allocate a larger percentage of their budget for instructional salaries tended to have larger achievement scores. It must be kept in mind that there are a number of concommitant variables associated with the transportation budget that might account for this relationship. That is, an implication of causality cannot be implied from the result.

Demographic and school background variables were more useful in predicting junior high achievement than elementary achievement. This may have been due to the greater variability of the junior high achievement scores. In addition, achievement at the two levels of school seemed to be affected by somewhat different variables. In particular, the percent of single parent families was more important at the junior high level. Prediction of elementary achievement seemed to be affected by total population of the district.

In order to examine the effectiveness of the selected variables, the final regression equations selected for the junior high level were run using the elementary school data. Similarly, the final elementary level regression equations were run using junior high data. The results are shown in Tables 8 and 9. The R^2 resulting from using the elementary level equations on junior high data was not very different than that resulting from using the elementary level equations on elementary school data. However, the R^2 resulting from using the junior high level equations on elementary school data was lower in both the factor and the variable analyses than the R^2 that was found with junior high equations and data.

Table 8

Regression of Junior High Achievement on District Demographic and School Variables Selected for Elementary Achievement

$R^2 = 0.338$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	5	689.69	137.94	13.59	0.0001
Error	133	1349.60	10.15		
Total	138	2039.29			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	-10.83				
MEDINC	-0.32	0.126	66.63	6.57	0.0115
NUTRAID	-18.54	4.767	153.56	15.13	0.0002
OCCLEVEL	9.54	2.068	216.09	21.30	0.0001
TPOP1F	-0.34	0.129	68.96	6.80	0.0102
PCTSAL	10.81	9.594	12.88	1.27	0.2619

Table 9

Regression of Elementary Achievement on District Demographic and School Variables Selected for Junior High Achievement

$R^2 = 0.295$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	5	275.65	55.13	9.89	0.0001
Error	118	658.07	5.58		
Total	123	933.72			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	3.97				
MEDINC	-0.34	0.100	64.35	11.54	0.0009
NUTRAID	-13.57	3.677	75.91	13.61	0.0003
OCCLEVEL	5.18	1.593	58.97	10.57	0.0015
SNGLPAR	-12.75	7.441	16.37	2.94	0.0892
PCTRNS	-26.24	11.901	27.10	4.86	0.0294

Results and Discussion of Building Analyses

The means, standard deviations, and ranges for the school building variables are shown in Table 10. The abbreviations used in reporting regression results are shown in this table. Note that much of the data for school buildings came from principal questionnaires. The questionnaires were returned by approximately 80% of the junior high principals and 68% of the elementary principals. Principals did not always answer every question, so some variables had as much as 40% missing data. The school buildings in this sample represented many types of school buildings. The average building enrollment was 334, but

enrollment ranged from 16 to 1840. There were about 18 students per teacher in elementary schools and 17 students per junior high teacher. The socioeconomic status of the student body varied widely between school buildings. The average occupation level of parents ranged from unskilled to skilled, and nutrition aid varied from 0.5% to 92%. The average teaching staff for a school building had a four year college education and 14.5 years of experience. The average principal had a masters degree and about 21 years of experience. Principals spent the largest amounts of time on teacher supervision and routine administration. However, there was great variation in the allocation of time by principals. Some principals had teaching or other administrative responsibilities which required their attention. Homework expectations varied too. Elementary students were expected to spend an average two hours per week on homework while 4.5 hours of homework per week were expected of junior high students. The average school day was 400 minutes long. Elementary schools spent 45% of the day teaching mathematics, reading, and language arts, while these basic areas accounted for 33% of the junior high day. The breakdown of the average school day by subject area is shown in Table 11. Note that many junior high principals did not include electives in their distribution of instructional time.

The correlations between achievement and other building variables at both elementary and junior high levels are shown in Table 12. Parents' occupation level was the variable which correlated most positively with achievement at both the elementary and junior high

Table 10

Means, Standard Deviations, and N Counts
for School Building Variables

Variable	Source	Abbrev.	Mean	SD	N	Range
No. Days When Pupils Were Present	DPI	DAYSYR	179.6	1.0	344	170-182
Length of School Day in Minutes	QST	DLENGTH	400	22.0	350	330-480
Adult Occupation Level	QST	OCCLEVEL	1.5	0.5	344	0.1-2.8
% Receiving Nutrition Aid	DPI,QST	NUTRAID	26	15.1	485	0-92
% Transferring Into Or Out Of School	QST	TRFS	10	8.8	344	0-68
Number of Days of Inservice	QST	INSERV	4.9	2.8	349	1-15
Average Enrollment:						
Grades 4 & 5	DPI	ENRELEM	47.3	24.1	356	12-232
Grades 7 & 8	DPI	ENRJRHI	131.1	93.0	147	16.5-428
Total Building Enrollment	DPI	ETOT	334.2	189.9	493	16-1840
Pupil Teacher Ratio:						
Grades 4 & 5	DPI	PTRELEM	18.4	4.1	309	9.3-38.5
Grades 7 & 8	DPI	PTRJRHI	16.6	3.5	145	6.2-26.3
Hours of Homework per Week:						
Grades 4 & 5	QST	HMWKELEM	2.0	1.6	208	0-10
Grades 7 & 8	QST	HMWKJRHI	4.5	2.6	135	0-14
Pupil Behavior	QST	BHVR	1.9	0.5	350	1-4
% Time Spent on Instruction in Basics:						
Grades 4 & 5	QST	BASELEM	45	6.5	210	18-59
Grades 7 & 8	QST	BASJRHI	33	5.8	129	19-46
Teachers:						
Per Diem Salary	DPI	TEACHSAL	$102	$12	493	$62-129
Education Level	DPI	TEACHED	1.2	0.2	493	0.3-1.9
Experience	DPI	TEXPTO	14.5	3.6	493	2.3-28.7
Absences	QST	ABS	8.6	6.0	297	0-36.5
Principals:						
Per Diem Salary	DPI	PRINSAL	$142	$16	450	$86-177
Education Level	DPI	PRINED	2.1	0.4	449	1-5
Experience	DPI	PEXPTO	20.8	8.2	450	0-43

Table 10 (cont.)

Variable	Source	Abbrev.	Mean	SD	N	Range
Principal's Time:						
% Program Development	QST	PROG	15	9.8	346	0-65
% Discipline	QST	DISCIPLN	11	8.8	346	0-70
% Public Relations	QST	PR	12	6.6	346	0-50
% Teacher Supervision	QST	SUPRVS	20	11.4	346	0-70
% Routine Administration	QST	ROUTINE	28	15.2	346	0-96
% Hall, Playground Duty	QST	HALLDUTY	9	6.9	346	0-45
% Other Duties	QST	OTHER	5	11.3	346	0-75
No. of Report Types	QST	REPORTS	3	2.1	493	0-6
Achievement Grades 4 & 5	ITP	ACHELEM	0.1	4.3	356	-12.1,9.5
Achievement Grades 7 & 8	ITP	ACHJRHI	0.3	4.4	169	-11.4,10.2

Table 11

Average Instructional Time Allocated to Each Subject Area (Minutes Per Day)

Subject	Grade 3	4	5	6	7	8
Reading	85	70	63	58	36	26
Language Arts	52	54	53	53	46	45
Math	46	49	49	48	47	47
Social Studies	30	38	42	43	46	47
Science	29	35	38	39	46	47
Foreign Language	0	0	0	0	4	9
Home Ec./Ind. Arts	0	0	1	4	26	31
Lunch & Recess	66	61	57	50	29	29
Art, Music, PE, Sports	40	42	44	48	57	56
In Class Administration	18	17	17	17	15	15
Homework Expected (Hours Per Week)	1.3	1.7	2.3	2.6	4.4	4.7

levels. There were negative relationships between achievement and the levels of student transfers and nutrition aid, ratings of pupil behavior, time spent on pupil discipline by principals, and building enrollment at both elementary and junior high levels.

Several of the correlations between achievement and the school building variables might have been due to other relationships. For example, the negative correlations between achievement and teacher education and experience might be explained by the relationships between these variables and total enrollment. Larger schools tended to have teachers with more education and experience, and the largest schools had lower achievement. Similarly, the negative relationship between achievement and principal's emphasis on discipline may have been influenced by a third variable, problems with student behavior. The negative relationship between time spent teaching basics and junior high achievement also must be interpreted carefully. At the junior high level, buildings which had lower achievement in prior years might have allocated more time to instruction of basic areas. That is, lower achievement scores might have "caused" schools to spend more time teaching basics rather than lower achievement scores being the result of more time spent teaching basics.

Some of the demographic and school background variables describing buildings were highly intercorrelated. The correlations between the building variables are shown in Appendix C. The socioeconomic variables (parents' occupation level, percent of students receiving nutrition aid, and percent of students transferring in or out of the school building

Table 12

Correlations Between Achievement and School Building Variables

Building Variable	Elementary Correlation	Junior High Correlation
Length of Day	0.18 (242)**	0.15 (138)
Days in Year	0.03 (237)	0.01 (136)
Occupation Level	0.56 (240)***	0.34 (133)***
Nutrition Aid	-0.72 (353)***	-0.51 (166)***
Transfers	-0.49 (238)***	-0.38 (136)***
Inservice	0.02 (242)	0.02 (137)
Enrollment Per Grade	-0.01 (349)	-0.14 (140)
Total Building Enrollment	-0.11 (356)*	-0.26 (169)**
Pupil Teacher Ratio	-0.03 (304)	-0.16 (138)
Homework	-0.05 (202)	-0.02 (120)
Pupil Behavior	-0.25 (243)***	-0.38 (137)***
Basics Instruction	0.00 (205)	-0.20 (118)*
Teacher Salary	-0.16 (356)**	-0.24 (169)**
Teacher Education Level	-0.08 (356)	-0.22 (169)**
Teacher Experience	0.00 (356)	0.06 (169)
Absences Per Teacher	-0.11 (206)	-0.10 (117)
Principal Salary	-0.09 (320)	-0.18 (146)*
Principal Education Level	0.07 (320)	-0.06 (146)
Principal Experience	0.04 (320)	0.11 (146)
Principal's Time:		
% Program Development	0.15 (240)*	0.08 (135)
% Discipline	-0.29 (240)***	-0.28 (135)**
% Public Relations	-0.10 (240)	-0.11 (135)
% Teacher Supervision	0.13 (240)*	0.26 (135)*
% Routine Administration	0.01 (240)	0.06 (135)
% Hall, Playground Duty	0.04 (240)	-0.09 (135)
% Other Duties	-0.04 (240)	-0.01 (135)*
No. of Report Types	0.06 (356)	0.19 (169)*

Note: N counts shown in parentheses.

* $p < .05$
** $p < .01$
*** $p < .001$

during the year) were significantly correlated ($p < .0001$ between all possible pairs). Also, several variables were associated with the total building enrollment. School buildings with smaller enrollments were associated with smaller classes and fewer pupils per teacher, longer school days, more principals assigned to other duties, lower principal and teacher salaries, teachers with less education and experience, more absences per teacher, fewer pupil disciplinary problems, and more homework. The length of a principal's experience was not associated with the way in which the principal allocated time. However, principals who rated pupil behavior as a problem in their building tended to allocate more time to student discipline.

The school building variables were entered into separate regression analyses of elementary and junior high achievement. First, achievement was regressed on the demographic variables. For school buildings there were only three demographic variables: parents' occupation level, nutrition aid, and the percents of students transferring into or out of the school building. The regression of junior high achievement on these demographic variables is shown in Table 13. The regression resulted in an R^2 value of 0.33 ($p < .0001$). The prediction of junior high achievement was significantly improved by all the demographic variables. At the elementary level the regression of achievement on the demographic variables resulted in an R^2 of 0.53 ($p < .0001$). See Table 14. Again, all three demographic variables significantly improved the prediction of achievement.

Table 13

Regression of Junior High School Achievement on Building Demographic Variables

$R^2 = 0.325$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	3	703.73	234.56	20.20	0.0001
Error	126	1463.10	11.61		
Total	129	2166.83			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	2.86				
OCCLEVEL	1.52	0.784	43.75	3.77	0.0545
NUTRAID	-12.57	3.498	149.92	12.91	0.0005
TRFS	-22.93	5.411	208.53	17.96	0.0001

Next the variables which had the most complete data were entered into the regression analyses. These were the variables obtained from the DPI files. Note that this analysis was based on 59% of the junior high schools whereas the regression using only demographic variables was based on 77% of the junior high schools. When only 59% of the junior high schools were included, the R^2 for the regression of achievement on the selected demographic variables increased from 0.34 to 0.46. Including all the DPI variables increased the R^2 to 0.50. Two of the DPI variables accounted for most of the increase in R^2. These two variables, principal's experience and total building enrollment, were selected for inclusion in later regression analyses. Table 15 shows the

Table 14

Regression of Elementary Achievement on
Building Demographic Variables

$R^2 = 0.532$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	3	2036.93	678.98	87.67	0.0001
Error	231	1789.10	7.75		
Total	234	3826.03			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	2.43				
OCCLEVEL	1.60	0.493	81.48	10.52	0.0014
NUTRAID	-13.43	1.836	414.05	53.46	0.0001
TRFS	-7.87	2.252	94.59	12.21	0.0006

regression of junior high achievement on the selected demographic and DPI variables.

At the elementary level missing data were also a problem. Using the DPI variables resulted in 51% of the data present compared to 66% of the data present when only demographic variables were included. The R^2 for the regression of elementary achievement on the selected demographic variables increased from 0.53 to 0.58 when only school buildings having complete demographic and DPI data were used. Adding the DPI variables to the regression equation only increased the R^2 to 0.60. One variable, total building enrollment, improved the prediction of achievement at a significance level of 0.056 which was only slightly above the 0.05 level

Table 15

The Regression of Junior High Achievement on Selected Demographic and DPI Building Variables

$R^2 = 0.481$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	5	820.36	164.07	17.23	0.0001
Error	93	885.39	9.52		
Total	98	1705.75			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	0.48				
OCCLEVEL	2.69	0.865	92.37	9.70	0.0024
NUTRAID	-14.46	3.824	136.21	14.31	0.0003
TRFS	-17.08	5.726	84.72	8.90	0.0036
PEXPTO	0.09	0.047	38.55	4.05	0.0471
ETOT	-0.42	0.166	59.55	6.25	0.0141

chosen. No other variable was close to significance. This variable alone accounted for half of the increase in R^2. In addition, this variable was selected at the junior high level. It was decided to select total building enrollment for inclusion in later regression analyses. The regression of elementary achievement on the demographic variables and building enrollment is shown in Table 16.

The data from the questionnaires were added into the regression analyses next. One variable, the percent of teacher absence, was omitted from the analyses because of the amount of data missing for this variable. The regression for the junior high level was based on 53% of

Table 16

The Regression of Elementary Achievement on Selected Demographic and DPI Building Variables

$R^2 = 0.588$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	4	1817.23	454.31	63.25	0.0001
Error	177	1271.26	7.18		
Total	181	3088.49			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	2.52				
OCCLEVEL	1.91	0.545	87.91	12.24	0.0006
NUTRAID	-13.83	2.029	333.48	46.43	0.0001
TRFS	-4.59	2.378	26.77	3.73	0.0551
ETOT	-0.33	0.173	26.49	3.69	0.0564

the junior high schools. The regression of junior high achievement on the selected demographic and DPI variables followed by the questionnaire variables resulted in an R^2 of 0.44. This was an increase of 0.04 from the regression on the selected demographic and DPI variables based on 53% of the schools. None of these variables from the questionnaires improved the prediction of achievement at a significance level of 0.05 in the presence of the selected DPI and demographic variables. For elementary school buildings, the regression including questionnaire data along with the selected demographic and DPI data was based on 52% of the elementary data. The R^2 from this regression was 0.59 which was an

increase of 0.03 using data from 52% of the schools. Length of school day and amount of time spent on basics were the two variables which contributed most to the prediction of achievement with the selected DPI and demographic building variables present (Table 17).

Table 17

The Regression of Elementary Building Achievement on Selected Demographic, DPI, and Questionnaire Variables

$R^2 = 0.587$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	6	1871.16	311.86	42.43	0.0001
Error	179	1315.79	7.35		
Total	185	3186.95			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	-8.64				
OCCLEVEL	1.70	0.536	74.31	10.11	0.0017
NUTRAID	-13.89	2.028	344.74	46.90	0.0001
TRFS	-5.72	2.466	39.58	5.39	0.0214
ETOT	-0.24	0.174	14.48	1.97	0.1622
DLNGTH	1.30	0.580	37.04	5.04	0.0260
BASELEM	6.42	3.208	29.48	4.01	0.0467

Finally, the principal's uses of time were allowed to enter the regression equations. These regressions were based on 51% of the junior high data and 55% of the elementary data. At the junior high level, the percentage of time the principal reported spending on discipline was a significant predictor of achievement (Table 18). The principals' uses

of time did not significantly increase the prediction of achievement in the presence of the other variables at the elementary level.

Table 18

The Regression of Junior High Building Achievement on Demographic, DPI, Questionnaire, and Selected Principal's Time Use Variables

$R^2 = 0.504$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	6	955.05	159.18	17.27	0.0001
Error	102	940.08	9.22		
Total	108	1895.13			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	3.47				
OCCLEVEL	2.13	0.808	64.03	6.95	0.0097
NUTRAID	-14.43	3.461	160.22	17.38	0.0001
TRFS	-15.82	5.324	81.35	8.83	0.0037
PEXPTO	0.08	0.042	35.67	3.87	0.0519
ETOT	-0.55	0.150	123.47	13.40	0.0004
DISCIPLN	-8.76	3.155	70.97	7.70	0.0066

In order to further examine the usefulness of the variables selected as significantly improving the prediction of achievement, the junior high regression equations were computed with the elementary level data and vice versa. The R^2 for the regression using junior high data and variables selected in the elementary building analyses was 0.40 (Table 19). This R^2 was lower than the R^2 of 0.59 computed for the elementary level equations used with elementary data (Table 17).

However, the regression using variables selected in the junior high analyses with elementary building data yielded an R^2 of 0.56 (Table 20) which was higher than the R^2 of 0.50 generated using junior high data (Table 18).

Table 19

The Regression of Junior High Building Achievement on Demographic and School Variables Selected in Elementary Building Analyses

$R^2 = 0.399$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	6	730.08	121.68	11.49	0.0001
Error	104	1101.33	10.59		
Total	110	1831.41			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	5.31				
OCCLEVEL	2.44	0.887	80.37	7.59	0.0069
NUTRAID	-11.96	3.806	104.56	9.87	0.0022
TRFS	-16.95	5.633	95.91	9.06	0.0033
ETOT	-0.43	0.161	77.06	7.28	0.0081
DLNGTH	-0.00	0.019	0.10	0.01	0.9212
BASJRHI	-6.64	5.899	13.41	1.27	0.2630

In both the analyses of elementary data and of junior high data, parents' occupation level, percentage of students receiving nutrition aid, percentage of student transfers, and total building enrollment were related to school building achievement and were useful for predicting the building's level of achievement. However, the other variables which

Table 20

The Regression of Elementary Building Achievement on Demographic and School Variables Selected in Junior High Building Analyses

$R^2 = 0.560$

	df	Sum of Squares	Mean Square	F	Prob.
Regression	6	1931.88	321.98	43.45	0.0001
Error	205	1519.13	7.41		
Total	211	3451.01			

	b Value	Std. Error	Sum of Squares	F	Prob.
Intercept	3.12				
OCCLEVEL	1.67	0.520	76.94	10.38	0.0015
NUTRAID	-13.43	1.981	340.84	45.99	0.0001
TRFS	-5.34	2.299	39.94	5.39	0.0212
ETOT	-0.36	0.163	35.27	4.76	0.0303
PEXPTO	0.01	0.021	3.52	0.47	0.4916
DISCIPLN	-4.11	2.742	16.61	2.24	0.1359

improved the prediction of achievement were different for elementary and junior high buildings. For junior high buildings, principal experience and the percentage of principal's time spent on discipline were the other variables most useful for predicting achievement. Principal's experience was positively correlated with achievement while discipline time was negatively correlated with achievement. Prediction of elementary building achievement was improved by the length of the school day and the amount of time spent on basic instructional areas. Length of school day was positively correlated with achievement. However, time

spent on basics was not correlated with achievement. This suggests that the relationship between achievement and the emphasis on basics may be different depending on the SES of the student body.

The conclusions regarding variables based on questionnaire data must be very tentative because of the amount of missing data involved. The regression equations for these variables were based on only about half of the school buildings in the sample.

Implications of District and Building Analyses

Both the analyses of the district data and the analyses of the building data identified parents' occupation and amount of nutrition aid as variables which were associated with achievement and which were useful for predicting the achievement level of the school. Other socioeconomic variables such as median family income, single-parent families, and amount of student transfers were also indicated as predictors of achievement. These findings supported previous research by the California Department of Education (1977) and others. As Stemnoch (1974) suggested, larger enrollments both for buildings and districts were associated with lower achievement. Pitts (1978) proposed that financial choices were associated with achievement. This study supported that assertion, although further research is needed to discover the ways in which budget choices are related to achievement levels.

There was an interesting difference between school districts and school buildings in the effectiveness of socioeconomic variables for

predicting achievement. At the district level socioeconomic variables were more effective for predicting junior high achievement than for elementary achievement. At the building level elementary achievement was more effectively predicted by socioeconomic variables. This might have been due to the different socioeconomic variables used in the two analyses. The percent of single-parent families was important for predicting junior high achievement at the district level, but this variable was not available at the building level. Similarly, income variables were used at the district level but were not available for buildings. In addition, at the district level the achievement measure had more variability for junior high schools than for elementary schools. At the building level the standard deviations of the achievement measure were similar for junior high and elementary school buildings. However, another explanation is that elementary school buildings differ more from each other on socioeconomic variables within school district than do junior high buildings. There are also more elementary buildings per district than junior high buildings. Therefore, differences between elementary buildings are more likely to be blurred in the district analyses.

SUMMARY

In summary, data were gathered on 156 Iowa public school districts from the 1980 U. S. Census, the Iowa Department of Public Instruction, and the Iowa Testing Programs. These school districts participated in the 1983 fall ITBS testing program at either the elementary or junior

high school level. Data were also gathered on the elementary and junior high buildings in these school districts from the Iowa Department of Public Instruction, the Iowa Testing Program, and questionnaires filled out by building principals. Elementary and junior high achievement as measured by the ITBS composite score were related to various demographic and school background variables. Background variables which could be quantified were chosen. Consequently, some interesting variables, like teachers' instructional and classroom management methods or school spirit, were not included. Using correlation and regression techniques, the data were analyzed separately for elementary and junior high school by building and district.

Achievement in school districts and school buildings was affected by many variables. Some socioeconomic variables, particularly parents' occupation and the percent of students receiving nutrition aid, were associated with achievement for elementary and junior high schools at both the district and building level. While these were variables beyond schools' control, the results suggested that decisions made by schools do affect the achievement level at the school. The way districts allocated their budgets between various programs and expenses seemed to be related to achievement. Similarly, at the building level the length of the school day and the emphasis of instruction were significant for elementary schools. In junior high schools, the principal seemed to have an especially important role in the achievement level of the building.

The relationships between the socioeconomic variables and achievement are particularly useful when interpreting achievement test results. Parents' occupation level, percent of students receiving nutrition aid, and total enrollment seem to be variables which can be used to define "similar" schools. Although measures of entry-level ability and motivation might be better predictors of achievement than parents' occupation and education levels, often data on entry-level achievement and student and parent motivation are not easily available. Parents' education and occupation levels provide a proxy for the level of ability and motivation of families in the catchment of the school district or building. Percent of students receiving nutrition aid may also reflect areas of economic distress due to high unemployment, for example. Nutrition aid, parents' occupation level, and total enrollment are variables on which schools have some data available. At the district level, information is available from the census on median family income, adult level of education, numbers of single-parent families, as well as occupation level. All schools that participate in the school lunch program are required to keep records of the number of students approved for free or reduced-price lunches. These data can be particularly important when schools are being compared or evaluated for excellence of instruction. They allow schools to be evaluated more nearly on the quality of their instruction and organization rather than other demographic and background variables. In addition, these data can be tabulated and prediction equations computed so that schools can easily identify their position on these background variables and compare

expected and actual achievement. Testing programs can provide expected achievement bands based on these variables to allow administrators to compare achievement scores with those of schools having similar socioeconomic characteristics. While such comparisons should not provide excuses for poor performance, they do allow evaluation of achievement with some of the variables that are beyond the control of school personnel already considered.

The relationships between the school variables and achievement also can be useful to school administrators and policy makers. With the pressure for improving school effectiveness, many solutions are being suggested. School administrators and legislative policy makers should consider research on school size, allocation of budget resources, instructional time, and student discipline before embarking on major changes in the public schools.

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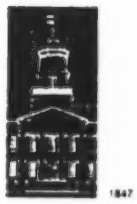
APPENDIX A

CORRESPONDENCE AND QUESTIONNAIRE SENT TO BUILDING PRINCIPALS

The University of Iowa
Iowa City, Iowa 52242

Iowa Testing Programs
334 Lindquist Center



March 29, 1984

Dear Principal:

Over the years the directors of the Iowa Testing Programs have frequently had requests for comparing ITBS and ITED test results for the local building and system with other buildings and systems with "similar" characteristics (socio-economic status, pupil/teacher ratio, per pupil expenditure, time on target, etc.). The Iowa Basic Skills Testing Program is currently conducting a study of the relationships among various demographic/curriculum variables describing school districts and attendance centers and their achievement levels. Results from the study will be considered in improving reports of building and system achievement on the ITBS.

Much of the needed information is available from the DPI and the U.S. Census. However, certain information, especially at the building level, must be obtained directly from the building administrator. As part of the study, principals at elementary and junior high attendance centers are being requested to fill out the enclosed questionnaire.

Please base your answers on the 1982-1983 school year. Be as accurate as possible without extensive review of past records. If you were not the principal at the school during 1982-1983, please consult with someone who was employed at the school for 1982-1983.

It is important that the questionnaire be completed and returned promptly. A self-addressed, stamped envelope is enclosed for returning the completed questionnaire. A summary of the results of this study will be distributed to participating principals.

Thank you for your cooperation.

A.N. Hieronymus, Director
Iowa Basic Skills Testing Program

ANH:lb

Enclosures

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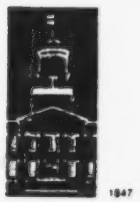
The University of Iowa
Iowa City, Iowa 52242

Iowa Testing Programs
334 Lindquist Center



May 17, 1984

Dear Principal:

About six weeks ago, you should have received a questionnaire from the Iowa Basic Skills Testing Program. The purpose of the questionnaire is to gather data that will help Iowa Testing Programs respond to requests from schools for information comparing ITBS test results for the local building and system with other buildings and systems with "similar" characteristics (socio-economic status, pupil/teacher ratio, per pupil expenditure, time on target, etc.). The data gathered will be considered in improving reports of building and system achievement on the ITBS.

In order for this information to be of maximum benefit to Iowa Testing Programs, each principal in the sample should return a completed questionnaire before June 8, 1984, if possible. A second questionnaire and a self-addressed, stamped envelope are enclosed for returning the completed questionnaire.

Please base your answers on the 1982-1983 school year. Be as accurate as possible without extensive review of past records. If you were not principal at the school during 1982-1983, please consult with someone who was employed at the school during 1982-1983. Try to make the total time spent in various subject areas similar to the amount of time in the school day. A short note explaining large differences in total time would be helpful. Junior high principals should include electives as well as required subjects.

A summary of the results of this study will be distributed to participating principals. If you have already returned the first questionnaire, please disregard this request. Thank you for your cooperation.

Sincerely,

A.N. Hieronymus, Director
Iowa Basic Skills Testing Program

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Enc.

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IOWA TESTING PROGRAMS

ATTENDANCE CENTER DEMOGRAPHICS
Principal Questionnaire

Instructions: Please base your responses to the following questions on the 1982-1983 school year. Answer for the grades appropriate for your building only. Be as accurate as possible.

1. Average class size (Do not include special education classes): _____

2. Number of days in the school year when pupils were in attendance: _____

3. Average length of school day (School day = hours and minutes from opening bell to dismissal): _____ hours _____ minutes

4. Average number of minutes per pupil school day spent on the following (Do not include before or after school activities. Answer for the grades and courses appropriate for your building only.):

	Grades					
	3	4	5	6	7	8
Reading						
Language Arts						
Mathematics						
Social Science						
Science						
Foreign Language						
Home Ec, Industrial Arts						
Lunch, Recess						
Music, Art, Physical Education, Sports						
In-Class Administration (Attendance, announcements, clean-up, etc.)						

5. Do the times shown above represent any major change in time allocations since the 1980-1981 school year? If so, please explain.

6. How many children transferred into your building between June 1982 and June 1983? (Do not include children entering kindergarten or those entering because of promotion from lower grades.) _____

7. How many children moved away from your building between June 1982 and June 1983? (Include transfers and drop-outs; do not include children transferred to another building in the district because of promotion to higher grades.) _____

8. In your building, disruptive behavior, fighting, vandalism, and/or drug and alcohol use were

_____ a) never a problem. _____ c) often a problem.
_____ b) seldom a problem. _____ d) a very serious problem.

9. What per cent of students were approved for reduced-priced or free lunches? _____

(over)

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10. How many hours per week were students expected to spend on homework?

Grade 3 _____	Grade 5 _____	Grade 7 _____
Grade 4 _____	Grade 6 _____	Grade 8 _____

11. How many days of teacher inservice were held during the school year? _____

12. How many days of teacher absence were incurred during the school year? _____

13. Feedback on student achievement was given to students and parents in the following ways (Check all those that apply.):

_____ Letter grades given at regular intervals.
_____ Regular reports on the mastery of specific objectives.
_____ Separate marks given for attitude, deportment, neatness.
_____ Midterm reports if the student was failing.
_____ Scheduled parent-teacher conferences for all students.
_____ Standardized achievement test scores reported to students and parents.
_____ Other (Please specify):

14. Estimate the percentage of students' parents in the following occupation levels. Numbers should add to 100%. Use the primary wage earner in each family. Place persons in occupations such as farming, clerical work, and sales according to the level of skills you believe they exhibit.

Professional/executive	_____
Skilled, technical	_____
Semi-skilled	_____
Unskilled	_____
TOTAL	100%

15. Estimate the percentage of time you spent in an average school day on the following activities. Numbers should add to 100%. If you were not a principal in 1982-1983, base your answers on the 1983-1984 school year.

Program planning and improvement (Include only time spent on such activities such as curriculum revision. Do not include time spent at workshops or professional meetings.)	_____
Student discipline	_____
Communication with parents and community	_____
Observing and providing feedback to teachers	_____
Routine administration	_____
On duty in lunchroom, hall, buses, or playground	_____
Other (Please specify):	_____
TOTAL	100%

16. Does your building have an ability (intelligence) testing program? ___ Yes ___ No
If yes, specify which test(s) at which grade(s):

Thank you for your cooperation.

Please return in the enclosed envelope to: The Iowa Testing Programs
334 Lindquist Center
The University of Iowa
Iowa City, IA 52242

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APPENDIX B

CORRELATIONS BETWEEN DEMOGRAPHIC BACKGROUND VARIABLES AND BETWEEN SCHOOL BACKGROUND VARIABLES AT THE DISTRICT LEVEL

Table 21

Correlations Between Demographic Background Variables for School Districts

	Total Population	Med Fam Income	Per Capita Income	Nutrition Aid	% Minority	% Single Parent Family	% Private School	% Rural	% Urbanized Area	Education Level
Med Fam Income	0.29									
Per Capita Income	0.30	0.87								
Nutrition Aid	0.08	-0.64	-0.58							
% Minority	0.62	0.20	0.22	0.05						
% Single Parent Family	0.59	0.26	0.29	0.16	0.46					
% Private School	0.23	0.13	0.02	-0.01	0.05	0.01				
% Rural	-0.52	-0.47	-0.48	0.07	-0.37	-0.64	-0.21			
% Urbanized Area	0.65	0.56	0.57	-0.19	0.41	0.45	0.18	-0.54		
Education Level	0.34	0.69	0.70	-0.47	0.24	0.32	-0.05	-0.52	0.53	
Occupation Level	0.27	0.49	0.58	-0.38	0.18	0.21	0.03	-0.47	0.45	0.82

Note: N = 149 except for % Minority where N = 137.

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Table 22

Correlations Between School Background Variables for School Districts*

	Total Enrollment	Per Pupil Budget	% General Education	% Special Education	% Trans-portation	% Extra Curricular	% Instruc-tional Salaries	% Administration
Per Pupil Budget	-0.01 (156)							
% General Education	0.11 (156)	-0.36 (156)						
% Special Education	0.29 (156)	0.13 (156)	-0.14 (156)					
% Transportation	-0.38 (156)	0.24 (156)	-0.56 (156)	-0.20 (156)				
% Extra Curricular	-0.35 (156)	-0.06 (156)	-0.15 (156)	-0.18 (156)	0.04 (156)			
% Instructional Salaries	0.21 (156)	-0.20 (156)	0.60 (156)	0.09 (156)	-0.48 (156)	-0.26 (156)		
% Administration	-0.18 (156)	0.10 (156)	-0.26 (156)	-0.26 (156)	0.12 (156)	0.15 (156)	-0.19 (156)	
Superintendent Educ.	0.37 (150)	0.01 (150)	-0.06 (150)	0.11 (150)	-0.22 (150)	-0.06 (150)	0.03 (150)	-0.15 (150)
Exper.	0.21 (154)	-0.20 (154)	0.34 (154)	-0.05 (154)	-0.17 (154)	-0.17 (154)	0.23 (154)	-0.30 (154)
Salary	0.65 (154)	-0.15 (154)	0.32 (154)	0.40 (154)	-0.50 (154)	-0.30 (154)	0.41 (154)	-0.37 (154)
Principals Educ.	0.11 (154)	-0.00 (154)	0.06 (154)	0.12 (154)	-0.17 (154)	-0.05 (154)	0.06 (154)	-0.06 (154)
Exper.	0.13 (154)	-0.20 (154)	0.19 (154)	-0.07 (154)	-0.03 (154)	-0.08 (154)	0.21 (154)	-0.12 (154)
Salary	0.35 (154)	-0.16 (154)	0.36 (154)	0.11 (154)	-0.31 (154)	-0.12 (154)	0.21 (154)	-0.31 (154)
Teachers Educ.	0.51 (156)	-0.16 (156)	0.24 (156)	0.21 (156)	-0.45 (156)	-0.24 (156)	0.28 (156)	-0.23 (156)
Exper.	0.31 (156)	-0.11 (156)	0.30 (156)	0.21 (156)	-0.31 (156)	-0.23 (156)	0.41 (156)	-0.37 (156)
Salary	0.56 (156)	-0.17 (156)	0.35 (156)	0.27 (156)	-0.45 (156)	-0.22 (156)	0.35 (156)	-0.39 (156)
Days in School Year	0.17 (156)	-0.00 (156)	-0.03 (156)	0.08 (156)	-0.07 (156)	-0.12 (156)	-0.09 (156)	-0.04 (156)
% Attendance	-0.15 (156)	0.11 (156)	0.04 (156)	-0.11 (156)	-0.06 (156)	0.06 (156)	0.03 (156)	0.18 (156)

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Table 22 (cont.)

	Superintendents			Principals			Teachers			Days in School Year
	Educ.	Exper.	Salary	Educ.	Exper.	Salary	Educ.	Exper.	Salary	
Superintendent Exper.	-0.10 (150)									
Salary	0.28 (150)	0.28 (154)								
Principals Educ.	0.07 (148)	-0.08 (152)	0.07 (152)							
Exper.	-0.07 (148)	0.24 (152)	0.23 (152)	-0.01 (154)						
Salary	0.20 (148)	0.28 (152)	0.69 (152)	0.07 (154)	0.28 (154)					
Teachers Educ.	0.32 (150)	0.16 (154)	0.69 (154)	0.21 (154)	0.27 (154)	0.52 (154)				
Exper.	0.10 (150)	0.17 (154)	0.54 (154)	0.19 (154)	0.34 (154)	0.45 (154)	0.53 (156)			
Salary	0.26 (150)	0.24 (154)	0.86 (154)	0.11 (154)	0.33 (154)	0.74 (154)	0.75 (156)	0.70 (156)		
Days in School Year	0.11 (150)	0.10 (154)	0.12 (154)	0.01 (154)	-0.01 (154)	0.01 (154)	0.10 (156)	0.04 (156)	0.08 (156)	
% Attendance	-0.21 (150)	-0.05 (154)	-0.14 (154)	0.06 (154)	0.05 (154)	-0.16 (154)	-0.17 (156)	-0.13 (156)	-0.15 (156)	-0.13 (156)

*N counts in parentheses.

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APPENDIX C

CORRELATIONS BETWEEN SCHOOL BUILDING BACKGROUND VARIABLES

Table 23

Correlations Between School Building Background Variables*

	OCCLEVEL	NUTRAID	TRFS	PRINSAL	PEXPTO	PRINED	TEACHSAL	TEXPTO	TEACHED	ETOT	ENRELEM	ENRJRHI	PTRELEM	PTRJRHI
NUTRAID	-0.63 (343)													
TRFS	-0.29 (337)	0.50 (343)												
PRINSAL	0.05 (317)	0.03 (442)	0.09 (315)											
PEXPTO	0.02 (317)	-0.05 (442)	0.01 (315)	0.20 (450)										
PRINED	0.09 (316)	-0.05 (441)	-0.05 (314)	0.03 (449)	-0.06 (449)									
TEACHSAL	0.16 (344)	0.06 (485)	0.25 (344)	0.49 (450)	0.25 (450)	0.02 (449)								
TEXPTO	0.06 (344)	0.02 (485)	0.07 (344)	0.07 (450)	0.19 (450)	0.00 (449)	0.43 (493)							
TEACHED	0.19 (344)	-0.02 (485)	0.15 (344)	0.27 (450)	0.21 (450)	0.07 (449)	0.75 (493)	0.24 (493)						
ETOT	0.19 (344)	-0.07 (485)	0.06 (344)	0.35 (450)	0.08 (450)	0.07 (449)	0.56 (493)	0.11 (493)	0.46 (493)					
ENRELEM	0.15 (240)	-0.08 (351)	0.03 (238)	0.22 (320)	0.05 (320)	0.04 (320)	0.32 (356)	0.04 (356)	0.22 (356)	0.67 (356)				
ENRJRHI	0.31 (114)	-0.00 (144)	0.34 (116)	0.47 (140)	0.16 (140)	-0.03 (140)	0.76 (147)	0.41 (147)	0.60 (147)	0.87 (147)	-----			
PTRELEM	-0.02 (205)	-0.08 (305)	0.15 (204)	-0.00 (281)	0.03 (281)	-0.00 (281)	0.24 (309)	0.02 (309)	0.16 (309)	0.23 (309)	0.26 (309)	-----		
PTRJRHI	0.14 (113)	0.08 (142)	0.31 (115)	0.19 (138)	0.23 (138)	-0.02 (138)	0.47 (145)	0.26 (145)	0.42 (145)	0.45 (145)	-----	0.52 (145)	-----	
DAYSYR	-0.08 (337)	-0.00 (343)	0.01 (337)	0.03 (315)	0.09 (315)	-0.00 (314)	0.06 (344)	-0.01 (344)	0.09 (344)	-0.01 (344)	-0.20 (237)	0.21 (117)	0.05 (202)	0.12 (116)

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Table 23 (cont.)

	OCCLEVEL	NUTRAID	TRFS	PRINSAL	PEXPTO	PRINED	TEACHSAL	TEXPTO	TEACHED	ETOT	ENRELEM	ENRJRHI	PTRELEM	PTRJRHI
DLENGTH	0.06	-0.14	-0.26	-0.17	-0.14	0.05	-0.42	-0.20	-0.30	-0.16	-0.16	-0.23	-0.36	-0.17
	(343)	(349)	(343)	(321)	(321)	(320)	(350)	(350)	(350)	(350)	(242)	(118)	(207)	(117)
INSERV	0.08	-0.04	0.11	0.14	0.06	0.08	0.18	0.07	0.11	0.09	0.08	0.25	0.07	0.05
	(342)	(348)	(342)	(320)	(320)	(319)	(349)	(349)	(349)	(349)	(242)	(117)	(207)	(116)
ABS	-0.08	0.14	0.25	-0.10	-0.04	0.01	-0.09	-0.01	-0.05	-0.20	-0.22	0.07	0.02	-0.08
	(295)	(297)	(291)	(273)	(273)	(272)	(297)	(297)	(297)	(297)	(206)	(101)	(175)	(100)
BHVR	-0.20	0.27	0.15	0.07	-0.07	-0.04	0.14	-0.01	0.12	0.16	0.08	0.20	0.08	0.27
	(344)	(349)	(343)	(321)	(321)	(320)	(350)	(350)	(350)	(350)	(243)	(117)	(208)	(116)
REPORTS	-0.10	-0.11	-0.04	-0.09	0.01	-0.01	-0.12	-0.00	-0.10	0.06	-0.03	0.11	0.05	-0.02
	(344)	(485)	(344)	(450)	(450)	(449)	(493)	(493)	(493)	(493)	(356)	(147)	(309)	(145)
BASELEM	-0.04	0.05	0.10	-0.03	0.03	-0.01	0.23	0.11	0.20	0.17	0.12	-----	0.06	-----
	(207)	(210)	(207)	(187)	(187)	(187)	(210)	(210)	(210)	(210)	(207)		(201)	
BASJRHI	-0.23	0.13	0.07	-0.04	-0.18	-0.10	-0.00	-0.20	-0.12	-0.06	-----	-0.17	-----	-0.17
	(125)	(128)	(127)	(111)	(111)	(111)	(129)	(129)	(129)	(129)		(110)		(110)
HMWKELEM	0.01	0.04	-0.05	-0.18	-0.07	0.02	-0.26	-0.16	-0.29	-0.20	-0.16	-----	-0.00	-----
	(206)	(208)	(205)	(188)	(188)	(188)	(208)	(208)	(208)	(208)	(203)		(197)	
HMWKJRHI	0.10	0.00	0.17	-0.08	-0.18	0.17	-0.16	-0.19	-0.18	-0.12	-----	-0.06	-----	-0.04
	(132)	(134)	(133)	(118)	(118)	(118)	(135)	(135)	(135)	(135)		(113)		(113)
PROG	0.14	-0.14	-0.05	-0.13	-0.11	0.06	-0.07	-0.06	-0.02	0.04	-0.02	0.19	0.10	0.05
	(340)	(345)	(339)	(318)	(318)	(317)	(346)	(346)	(346)	(346)	(240)	(116)	(205)	(115)
DISCIPLN	-0.12	0.23	0.11	0.04	-0.08	-0.05	0.09	-0.08	0.15	0.04	0.04	-0.06	-0.02	0.05
	(340)	(345)	(339)	(318)	(318)	(317)	(346)	(346)	(346)	(346)	(240)	(116)	(205)	(115)
PR	0.05	0.03	0.13	-0.02	0.00	-0.03	0.18	0.03	0.15	0.10	0.03	0.13	0.18	0.14
	(340)	(345)	(339)	(318)	(318)	(317)	(346)	(346)	(346)	(346)	(240)	(116)	(205)	(115)
SUPRVS	0.20	-0.15	-0.08	0.10	0.08	0.02	0.16	0.08	0.16	0.14	0.18	0.16	0.02	-0.06
	(340)	(345)	(339)	(318)	(318)	(317)	(346)	(346)	(346)	(346)	(240)	(116)	(205)	(115)
ROUTINE	-0.12	0.06	0.03	0.02	0.05	0.04	-0.10	0.05	-0.11	-0.11	-0.09	-0.09	-0.09	0.04
	(340)	(345)	(339)	(318)	(318)	(317)	(346)	(346)	(346)	(346)	(240)	(116)	(205)	(115)
HALLDUTY	-0.02	-0.03	-0.03	0.10	-0.05	-0.03	0.12	0.03	0.12	0.14	0.17	-0.01	0.04	-0.04
	(340)	(345)	(339)	(318)	(318)	(317)	(346)	(346)	(346)	(346)	(240)	(116)	(205)	(115)
OTHER	-0.06	0.01	-0.03	-0.10	0.04	-0.03	-0.21	-0.07	-0.18	-0.19	-0.16	-0.20	-0.10	-0.10
	(340)	(345)	(339)	(318)	(318)	(317)	(346)	(346)	(346)	(346)	(240)	(116)	(205)	(115)

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Table 23 (cont.)

	DAYSYR	DLNGTH	INSERV	ABS	BHVR	REPORTS	BASELEM	BASJRHI	HMWKELEM	HMWKJRHI	PROG	DISCIPLN	PR	SUPRVS	ROUTINE	HALLDUTY
DLNGTH	0.04															
	(344)															
INSERV	0.12	-0.08														
	(342)	(348)														
ABS	0.09	-0.10	0.11													
	(292)	(297)	(297)													
BHVR	0.01	-0.05	0.02	-0.10												
	(343)	(349)	(348)	(297)												
REPORTS	-0.01	0.15	-0.06	-0.01	0.06											
	(344)	(350)	(349)	(297)	(350)											
BASELEM	-0.09	-0.16	0.06	-0.02	0.04	-0.05										
	(206)	(210)	(209)	(178)	(210)	(210)										
BASJRHI	-0.12	-0.20	-0.04	-0.05	0.06	0.12										
	(127)	(129)	(128)	(109)	(128)	(129)										
HMWKELEM	0.08	0.18	-0.14	0.11	0.01	0.14	0.02									
	(202)	(207)	(207)	(177)	(208)	(208)	(201)									
HMWKJRHI	-0.11	0.18	0.08	0.18	-0.04	-0.03	-----	0.11	-----							
	(133)	(135)	(134)	(118)	(134)	(135)		(125)								
PROG	0.08	0.05	-0.01	0.07	-0.16	0.02	0.03	-0.02	0.08	-0.03						
	(339)	(345)	(344)	(297)	(345)	(346)	(207)	(127)	(206)	(133)						
DISCIPLN	-0.04	0.07	-0.08	-0.04	0.36	0.14	0.05	0.01	0.04	-0.07	-0.15					
	(339)	(345)	(344)	(297)	(345)	(346)	(207)	(127)	(206)	(133)	(346)					
PR	-0.06	-0.10	0.09	0.00	0.04	0.09	0.09	0.04	0.05	0.11	0.01	0.04				
	(339)	(345)	(344)	(297)	(345)	(346)	(207)	(127)	(206)	(133)	(346)	(346)				
SUPRVS	0.01	-0.06	0.01	-0.08	-0.22	-0.07	0.19	-0.05	-0.08	0.14	0.04	-0.26	0.03			
	(339)	(345)	(344)	(297)	(345)	(346)	(207)	(127)	(206)	(133)	(346)	(346)	(346)			
ROUTINE	0.02	-0.01	0.02	0.05	-0.00	-0.14	-0.07	-0.03	-0.05	-0.17	-0.33	-0.24	-0.29	-0.37		
	(339)	(345)	(344)	(297)	(345)	(346)	(207)	(127)	(206)	(133)	(346)	(346)	(346)	(346)		
HALLDUTY	-0.02	-0.10	0.00	-0.16	0.08	-0.00	0.14	0.12	0.02	0.08	-0.19	0.10	-0.06	-0.12	-0.12	
	(339)	(345)	(344)	(297)	(345)	(346)	(207)	(127)	(206)	(133)	(346)	(346)	(346)	(346)	(346)	
OTHER	-0.02	0.08	-0.01	0.08	0.01	0.08	-0.22	-0.01	0.03	-0.02	-0.20	-0.13	-0.13	-0.23	-0.21	-0.19
	(339)	(345)	(344)	(297)	(345)	(346)	(207)	(127)	(206)	(133)	(346)	(346)	(346)	(346)	(346)	(346)

*N counts shown in parentheses.

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